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(54) Title: <b>TAMPER EVIDENT TAPES AND LABELS</b>					
(57) Abstract					
<p>A tamper-evident tape or label (20) to be adhered to various items, like security envelopes, bags, packages, markings, price tags, etc. The tape or label (20) comprising a base layer (32) made of a pliable light transmissive plastic material, and the base layer (32) being provided with an upper face and an opposing bottom face, such base layer (32) being adherable (34) to the said items by the bottom face thereof. The base layer (32) being provided with at least one tamper-evident means (30) revealable when an unauthorized attempt to remove said tape or label (20) from the said items has taken place, and the said base layer (32) being provided with a preventing means (40) to prevent direct access to the upper face thereof.</p>					

## TAMPER EVIDENT TAPES AND LABELS

### TECHNICAL FIELD

This invention relates to security sealing and marking of different items and products, and particularly for tamper evident tapes and labels having multiple layers, at least one layer attachable to different items and products, to clearly indicate that the tamper evident tape or label was tampered with thus providing an indicator as to the security condition of the container to which the tamper evident tape or label is attached thereto.

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### BACKGROUND ART

There is constant need for evident tampering tapes and labels, protecting items, containers and products such as envelopes, from opening without leaving evidence of tampering or from transferring labels from one product to another without leaving evidence of tampering. The need for evident tampering tapes and labels results from increasing worldwide commercial activities in sealed containers such as security envelopes and from the increased used of pricing and other labels on containers and products containing valuable goods or merchandize.

Another known method for tamper evident tapes and labels uses a tape at least one layer of which includes continuous webs of fracture or cuts in a known and pre-designated manner. When removed such tape will fragment and the interconnecting portion between the tape and the container or product 10 to which it is attached will indicate that the tape has been tampered with. This method of protection used by tamper evident tapes and labels may be circumvented through attaching a tape that is adherable on one side on the layer that includes the continuous webs of fracture or cuts and lift the tape as a whole without creating any discernable fragments in the continuous webs of 15 fracture.

When an additional layer of material is attached to the layer of continuous webs of fracture it is possible, under certain conditions, to remove and re-attach the tape without shown evidence that the tape was tampered with.

In making the present invention, it has been observed that there is a distinct need to overcome the inadequacies of the previously known tapes, to ensure that a tamper evident tape indicate any attempt to tamper with a tape or label, because previously known tapes include the drawbacks outlined here 25 above.

## DISCLOSURE OF THE INVENTION

## BEST MODE FOR CARRYING OUT THE INVENTION

With reference to fig.1 there is shown a security container for keeping inside of various items like papers, valuable goods or merchandise. The container is formed as a bag or envelope 10 made of a sheet of plastic material, for example polyethylene, cupboard, paper or any other suitable impact resistant material. The envelope comprises plurality of edges sealed along margins 12 so as to define a receptacle portion 14 for receiving the items. A certain part of the envelope is unsealed to define an access portion 16 through which the items can be placed into the receptacle portion. The envelope is provided with a tamper-evident tape 20 enabling to reveal whether an unauthorized attempt to open the envelope has taken place after it is sealed. The construction of the tape in accordance with the present invention will be explained in details later on. Here it should only be mentioned that the tape is provided on that surface thereof which faces the envelope with an adhesive covered by a removable protective liner. By virtue of this provision it is possible to expose the adhesive so as to adhere the tape firmly to the envelope and thus to seal thereof.

In fig. 2 there is shown that the tape is adhered to the envelope after the protective liner is removed from an attachment portion 22 thereof. The tape is firmly adhered to the receptacle portion of the envelope. The sealing portion 24 of the tape is still covered by the protective liner 28 and is not adhered yet. The border between the envelope's receptacle portion and access portion is shown by a dotted line and one can clearly see that the tape is wide enough to overlap the access portion and to be adhered thereto. It should be realized that adhering of the tape to the envelope as described above can be effected either manually or automatically. In the last case it is advantageous to combine in one process the step of sealing and cutting of the envelope from

5 This situation is schematically depicted in fig.8. The situation of removing the tape together with the security pattern is seen in fig. 9. The paint layer is coated by an adhesive 34, which is covered by the removable protective liner. In order to enable exposing the adhesive covering the attachment portion 22 without exposing the adhesive covering the sealing portion 24 the protective 10 liner consists of two separate parts 26,28, which can be removed independently. In practice the suitable adhesive is commercially available glue, for example acrylic-based glue. In practice the most suitable adhesive can be chosen by a skilled in the art person after considering surface energy of the plastic material the envelope is made of. Preferably, the thickness of the 15 adhesive is 20-100 microns. The protective liner can be made of a commercially available siliconized film. Preferably, the thickness of the liner is 20-100 microns, being preferably 50 microns.

In addition to the above described tamper-evident means the base layer can be provided also with additional tampering-evident means rendering the 20 base layer easily disruptable if one tries to remove thereof from the envelope. These additional new means comprises a plurality of through-going scores or cuts 36, which are cut through the base layer up to the adhesive. The scores or cuts are arranged on the base layer preferably across its entire surface. The shape of the cuts can be different, but in practice they are configured as 25 discrete V-like cuts best seen in fig.7. In practice in order to render the base layer even more disruptable it preferably advantageous to distribute the cuts laterally along the tape length so as to provide a region 38 in the middle of the tape, which is free of the cuts. The width of the free of cuts region is preferably about 8 mm. By virtue of the scores or cuts made in the base layer the tape 30 becomes severely disrupted when someone attempt to remove it from the envelope and thus an unequivocal evidence of the tampering attempt is provided. This situation is schematically shown in fig.10.

In accordance with the present invention the base layer is provided with a covering layer 40, attachable thereto and constituting a barrier, preventing

5 tampering with the tape was effected by heating, cooling or by detaching  
thereof by a self-adhesive tape.

With reference to fig.6b it is shown the tape firmly adhered by its adhering portion to the receptacle portion 14 of the envelope, while its sealing portion is still covered by the liner part 34. Upon peeling off the protective liner 10 part the adhesive becomes exposed and the sealing portion of the tape can be firmly attached to the corresponding access portion 16 of the envelope so as to seal thereof.

The above explained tape employs the base layer and the covering layer which are separately manufactured from the plastic film or other material and connected there between. With reference to fig.11 there is shown an additional embodiment of the present invention in which a tape 50 is manufactured from the blown polymer film and is configured as a sleeve. In this embodiment one half 52 of the sleeve constitutes the base layer, while the opposite half 54 thereof, constitutes the protective layer. As in the previous embodiment the outwardly facing side of the base layer is provided with the above-described tamper-evident means and is covered by an adhesive. The adhesive is closed by the removable protective liner.

It should be appreciated that the present invention is not limited to the above-described embodiments and that changes and modifications can be made by one ordinarily skilled in the art without deviation from the scope of the invention, as will be defined in the appended claims. For example one can contemplate the use of the above-described tamper-evident tape not only for sealing of security envelopes but also for sealing of a suitcase or any other luggage. Instead of elongated tape one can use a label attachable to the suitcase or to its handle as shown in fig.12. The tape or label can be used, for example, for the sealing of a box or a package for CD as shown in figs. 13,14. The particular shape of the label can be round or polygonal, for example

## CLAIMS

1. A tamper-evident tape or label to be adhered to various items, like security envelopes, bags, packages, markings, price tags, etc., said tape or label comprising a base layer made of a pliable light transmissive plastic material, said base layer being provided with an upper face and an opposing bottom face, said base layer being adherable to said items by the bottom face thereof, said base layer being provided with at least one tamper-evident means revealable when an unauthorized attempt to remove said tape or label from said items has taken place, said base layer being provided with a preventing means to prevent direct access to the upper face thereof.

2. The tamper-evident tape or label as defined in claim 1, in which said base layer is made of translucent plastic material and said tamper-evident means comprise a security pattern printed on the bottom face of the base layer, said security pattern being covered by a colored layer so as to ensure that the pattern is imperceptible when the tape or label is intact and said pattern becomes perceptible during an attempt to remove the tape or label from the

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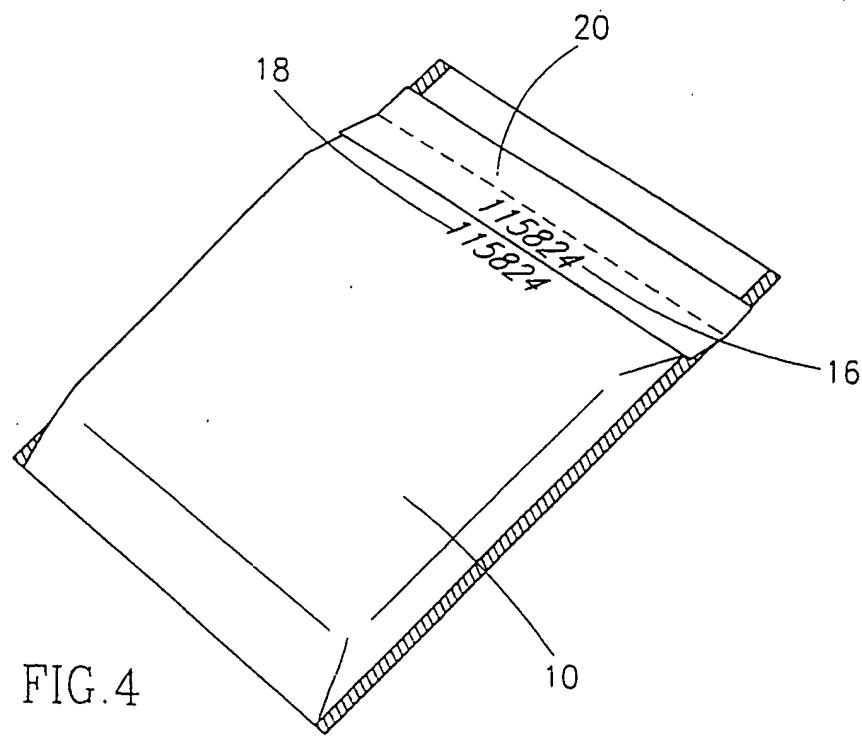
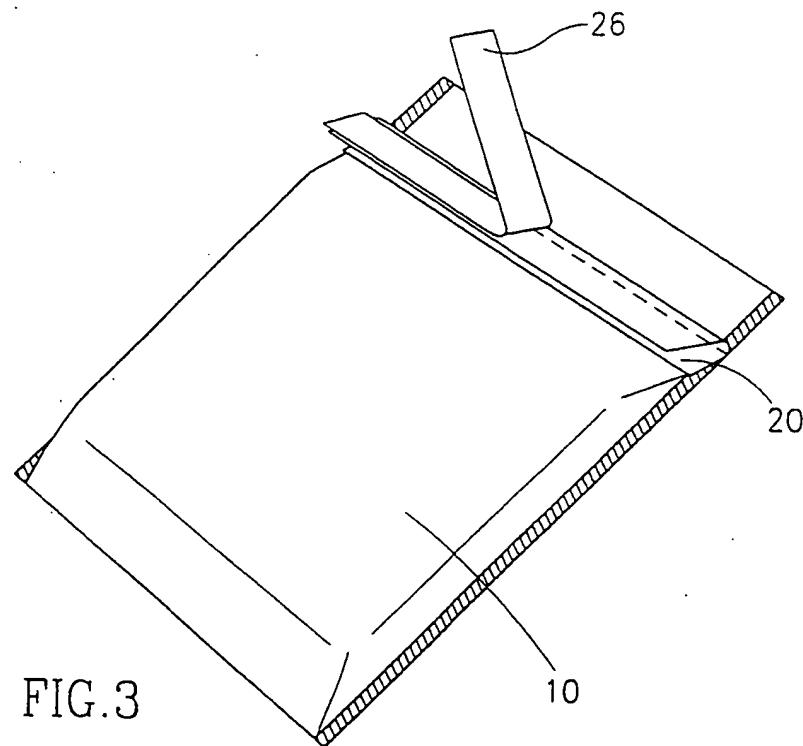
7. The tamper-evident tape or label as defined in claim 1, in which said bottom layer is made of low density cast polymer.

8. The tamper-evident tape or label as defined in claim 1, in which 10 said base layer is made of low density blown polymer.

9. The tamper-evident tape or label as defined in claim 7, in which said bottom layer is made of polyethylene and said covering layer is made of a material chosen from the group comprising 15 polypropylene, polyethylene or PVC.

10. The tamper-evident tape or label as defined in claim 7, in which said covering layer is made of bi-oriented or mono-oriented polymer.

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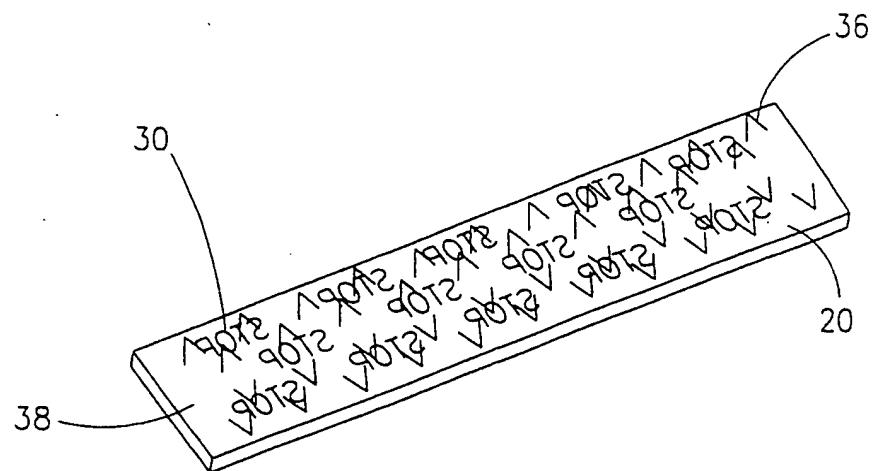


FIG. 7

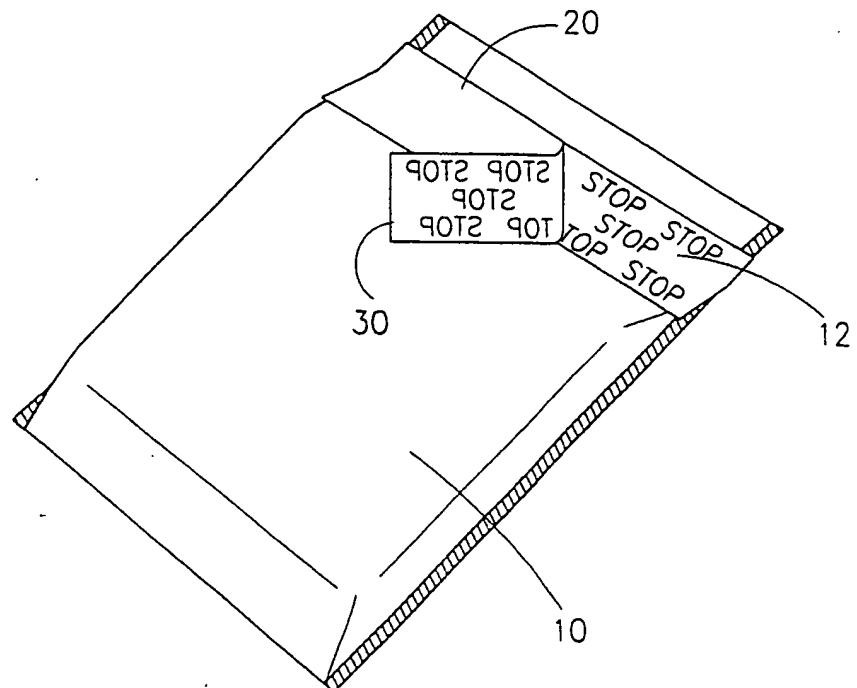


FIG. 8

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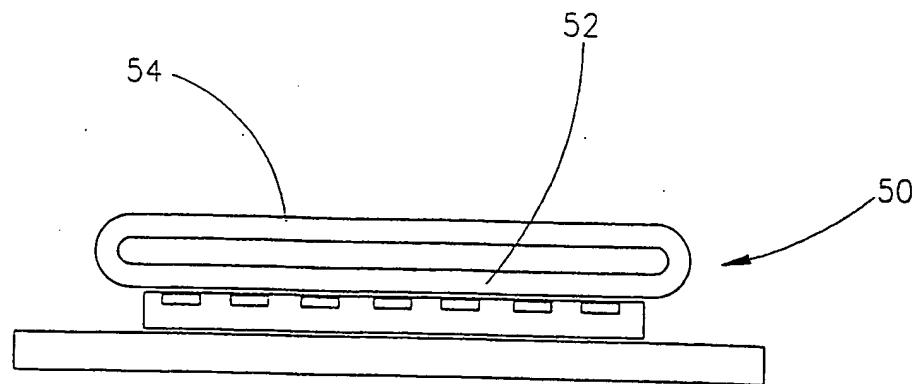


FIG.11

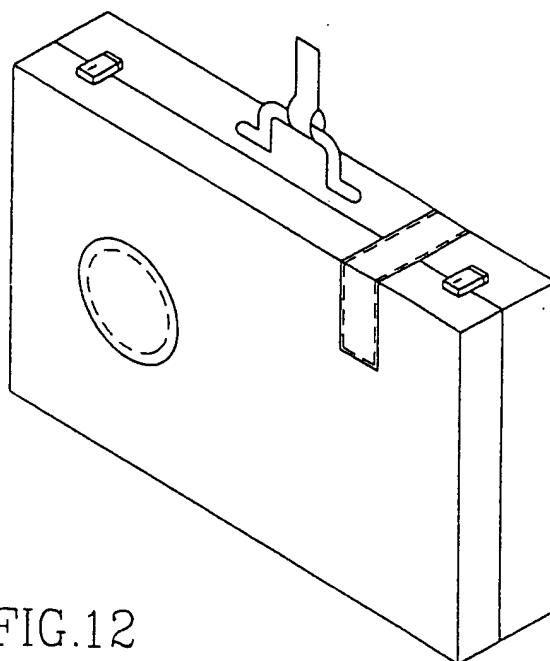


FIG.12

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/IL99/00243

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :B32B 7/10, 9/00; G09F 3/03

US CL :283/80, 81, 98, 100, 101; 40/6, 299, 306, 308, 312, 630; 428/916

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 283/80, 81, 98, 100, 101; 40/6, 299, 306, 308, 312, 630; 428/916

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4,876,123 A (RIVERA et al) 24 October 1989, see Fig. 1A	1
Y		2-10

 Further documents are listed in the continuation of Box C.  See patent family annex.

• Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
• A document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
• E earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
• L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
• O document referring to an oral disclosure, use, exhibition or other means		
• P document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search

20 SEPTEMBER 1999

Date of mailing of the international search report

21 OCT 1999

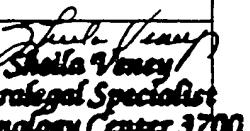
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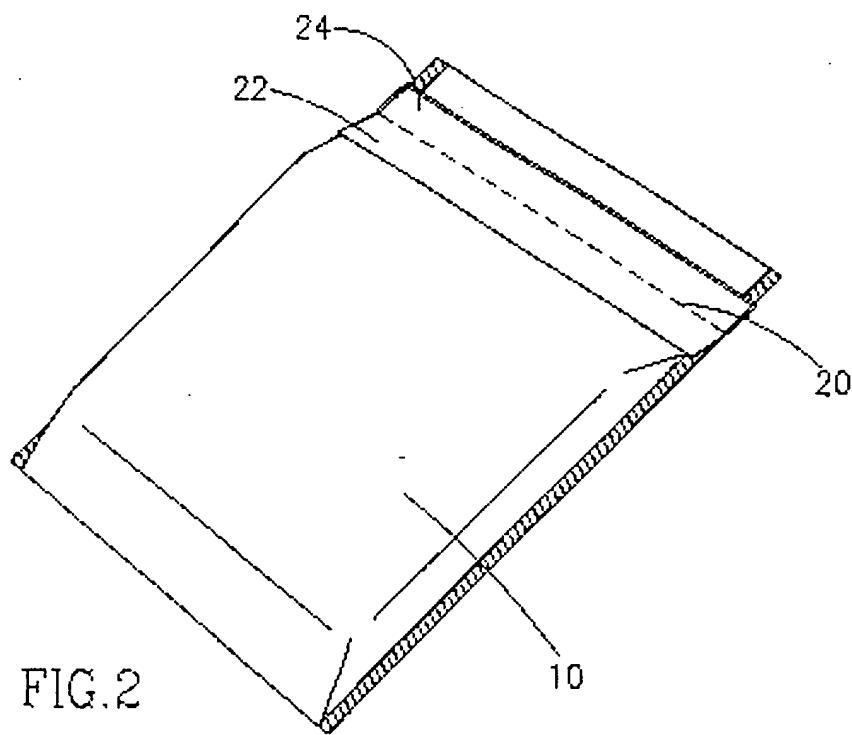
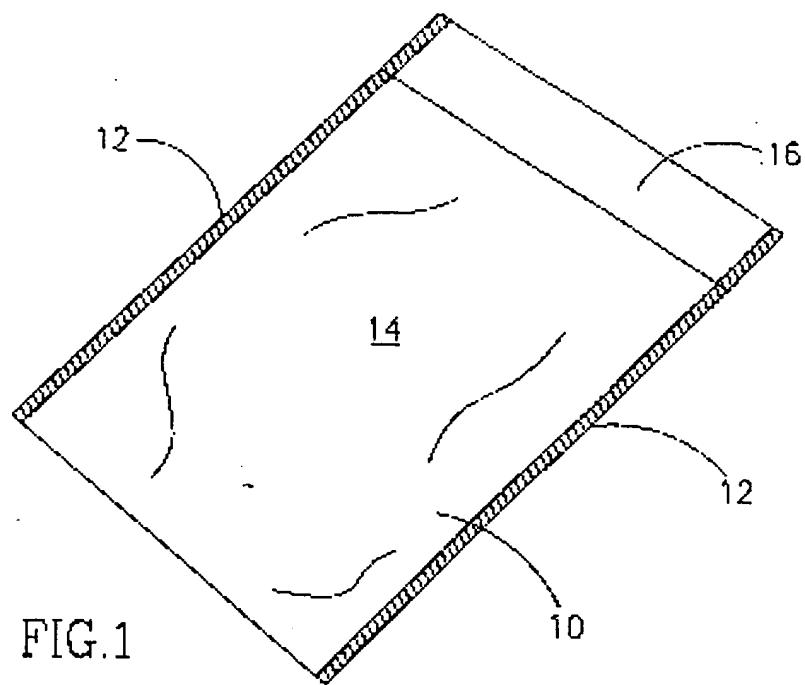
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 Paralegal Specialist  
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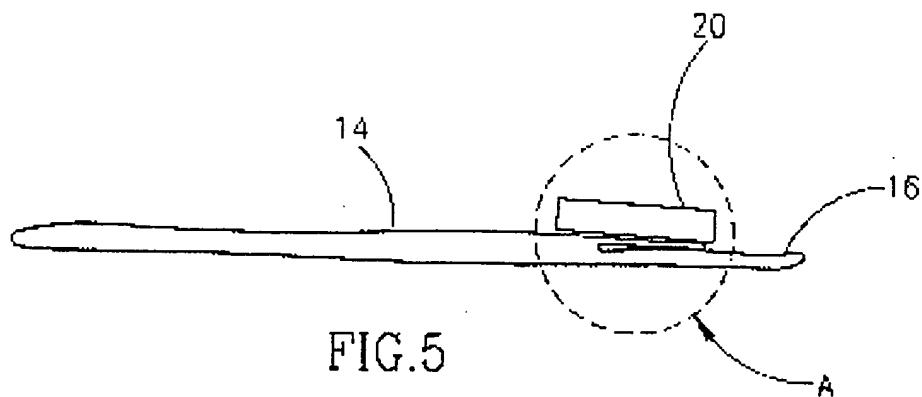


FIG.5

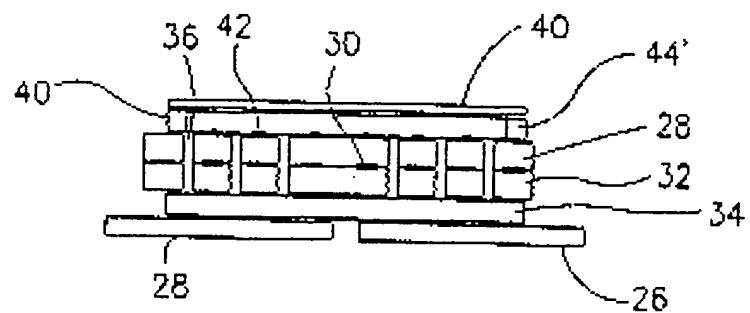


FIG.6A

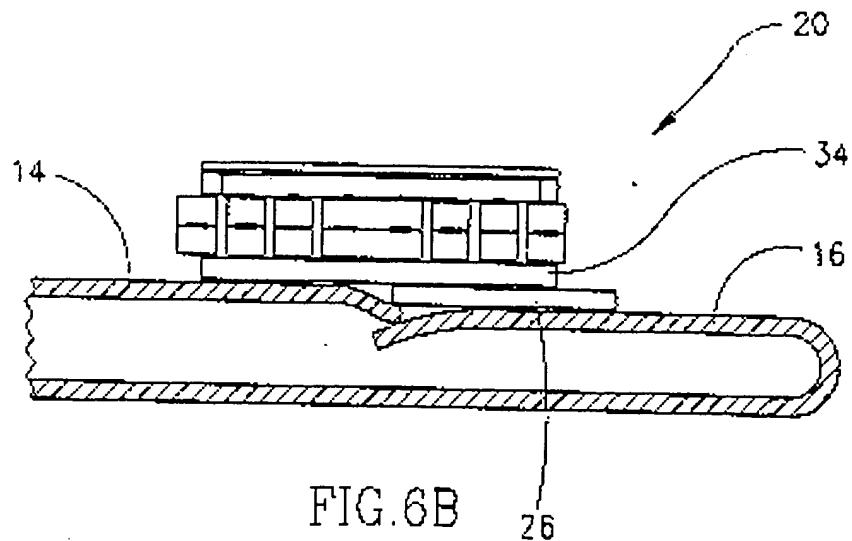


FIG.6B

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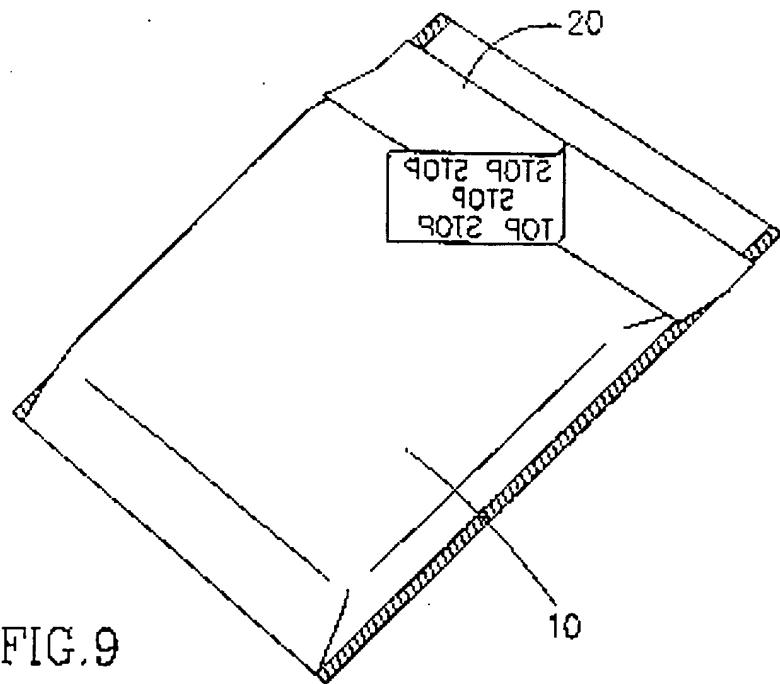


FIG. 9

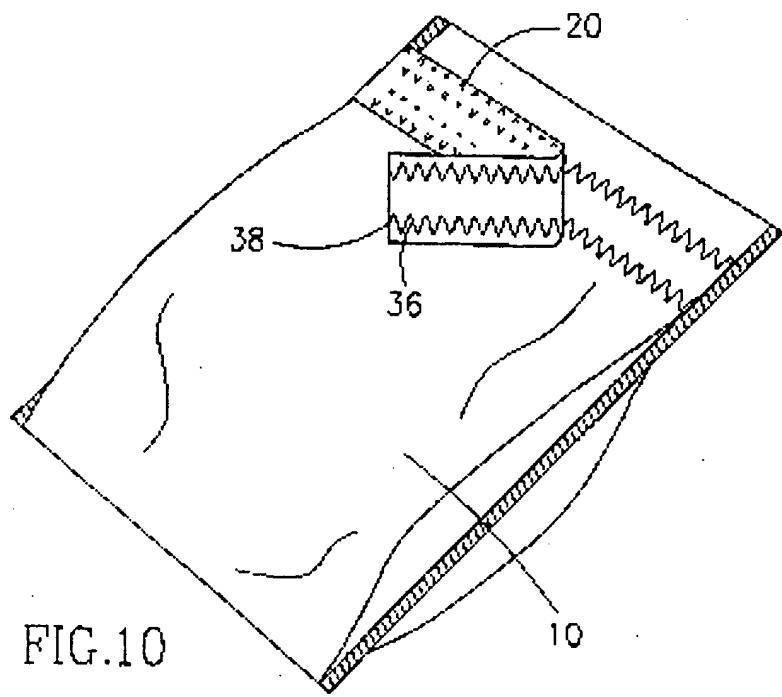


FIG. 10

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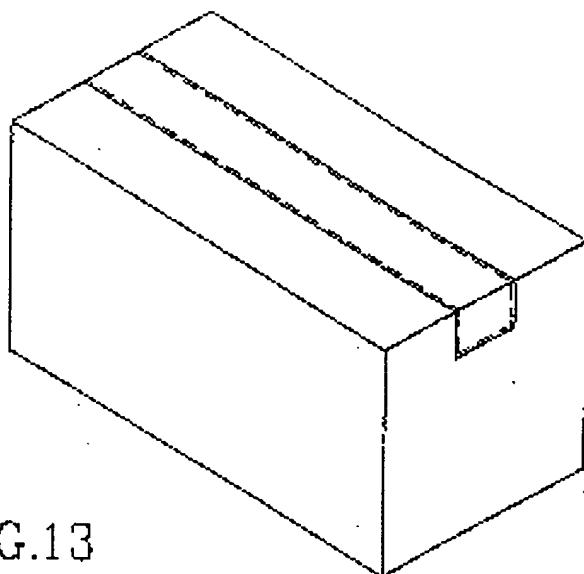
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FIG.13

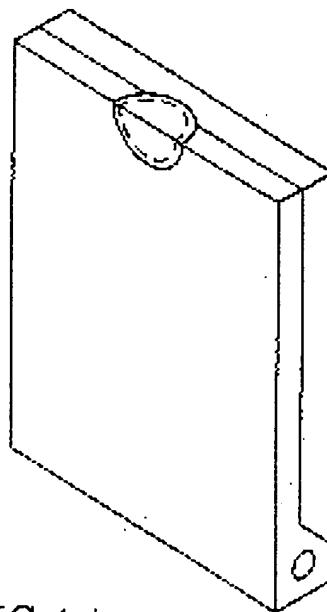


FIG.14